

CHECK-LIST OF THE CEPHALOCHORDATES, SELACHIANS, AND FISHES OF QUEENSLAND.

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(With Two Text-figures.)

FOR many years check-lists of the fishes of Tasmania,¹ New South Wales,² Victoria,³ and South Australia (in part)⁴ have been in existence,⁵ the while Queensland with, perhaps because of, her magnificent fish-fauna was content to remain unlisted. The present work is designed to remove this reproach from our State.

The model on which it is proposed to fashion the check-list is as follows :—

(1.) *Higher divisions*, from Class to Family ; scientific name only or scientific name and general vernacular name.

(2.) *Genus* ; earliest scientific name and reference, with such synonym or synonyms as may at any time have been in use among or familiar to Australian authors.

(3.) *Species* ; earliest scientific name with author, and vernacular name or names if any ; where more than one vernacular name is given, that which is considered preferable is printed in SMALL CAPITALS ; references to the earliest author, to Günther's "Catalogue of the Fishes in the British Museum" and Macleay's "Descriptive Catalogue of Australian Fishes"⁶ if included in either, and failing them to the earliest Australian notice ; reference to the earliest record for Queensland.

(4.) *Illustration* ; reference to the best figure or figures, preference being given to Australian work or, where that is not available, to the best figure in the Queensland Museum Library.

¹ Johnston ; Classified Catalogue of the Fishes of Tasmania (Proc. Roy. Soc. Tas., 1882, pp. 53-144) and Complete List of Tasmanian Species (Ibid., 1890, pp. 30-39).

² Ogilby ; Catalogue of the Fishes of New South Wales, with their principal synonyms, 1886, pp. 1-67.

Waite ; A Synopsis of the Fishes of New South Wales (Mem. N. S. Wales Natur. Club, No. 2, 1904, pp. 1-59).

³ Lucas ; A Systematic Census of Indigenous Fish, hitherto recorded from Victorian Waters (Proc. Roy. Soc. Vic.—new ser.—ii, 1890, pp. 15-47).

⁴ Zietz ; A Synopsis of the Fishes of South Australia ; pt. i, *Leptocardii, Cyclostomata, Plagiostomi, and Holocephali* (Trans. Roy. Soc. S. Austr., xxxii, 1908, pp. 288-293) ; pt. ii, *Clupeidæ to Syngnathidæ* (Ibid., pp. 294-299) ; pt. iii, *Syngnathidæ cont. to Serranidæ*, part (Ibid., xxxiii, 1909, pp. 263-269).

⁵ Even West Australia has a list of sorts (Fraser, Natural History, etc., of Western Australia, 1903, pp. 150-154), but as, among other eccentricities, so well known a fish as the "tailor" appears twice thus—*Pomatomus saltatrix*, Fremantle, p. 151 and *Tennodon saltuton*, "Tailor-fish," p. 152—perhaps the less said about it the better.

⁶ Only the catalogue number of the species is given.

(5.) *Dimensions* ; approximately the greatest authenticated dimensions in length, width (in certain rays), and weight.

(6.) *Uses* ; if any.

(7.) *Range* ; within the boundaries of the State, except in certain noteworthy instances, as it is considered that the extralimital distribution is beyond the scope of this work.

In practice individual modifications of this scheme have of necessity been made occasionally, but these have been introduced as seldom as is consistent with the general trend of the work.

Finally the reception of Garman's "Plagiostomia," during the current May,⁷ necessitated the addition of references to that work, imperfect though it be.

For the purpose of facilitating information regarding the geographical distribution of our fishes I propose to divide Queensland into three zoological districts, as follow :—

South Queensland (S.Q.).—

Embracing all the coastline between the mouth of the Tweed River, our natural boundary, and the Tropic of Capricorn, the islands and reefs outlying therefrom and the hinterland to the South Australian and Northern Territory marches, with Moreton, Hervey, and Wide Bays, and Port Curtis as its principal inlets.

Middle Queensland (M.Q.).—

Extending in similar fashion from the tropic to 20° S. lat., with Keppel and Shoalwater Bays, Broad Sound, Repulse and Edgecumbe Bays. And

North Queensland (N.Q.).—

Comprising York Peninsula and the Gulf of Carpentaria, with their respective islands, reefs, rivers, and hinterlands.

The following abbreviations will be employed throughout this work :—

A.M., Australian Museum ; B.N.G., British New Guinea ; B.R., Barrier Reef ; D.N.G., Dutch New Guinea ; M.Q., Middle Queensland ; N.Q., North Queensland ; N.S.W., New South Wales ; N.T., Northern Territory ; O.C., Old Collection of Q.M., Queensland Museum ; S.A., South Australia ; S.Q., South Queensland ; Tas., Tasmania ; T.S., Torres Strait ; Vic., Victoria ; W.A., West Australia.

Class I—PROTOCHORDATA.

Order I—CEPHALOCHORDATA.

Family I—BRANCHIOSTOMATIDÆ. "THE LANCELETS."

Genus I—**BRANCHIOSTOMA** Costa, Cenni Zool. Napol., 1834, p. 49 (*lubricum lanceolatum*). Syn.—*Amphioxus* Yarrell 1836 ; *Dolichorhynchus* Willey 1901.

⁷ The part dealing with the selachians was written during the winter of 1914, but was crowded out of that year's "Memoirs" from want of space.

1. *belcheri* Gray.

Proc. Zool. Soc. London, 1847, p. 35 : Lundu River, Borneo (as *Amphioxus belcheri*)—Günther, Voy. Alert, Zool., p. 32.

Figure :—Kirkaldy, Quart. Journ. Mier. Sci., xxxvii, p. 313, pl. 35, fig. 8.

Dimensions :—To about 50 millim.

Range :—Prince of Wales Island, T.S.

Genus 2—**EPIGONICHTHYS** Peters, Mon. Akad. Berlin, 1876, p. 325 (*cultellus*).
Syn.—*Paramphioxus* Haeckel 1893 ; *Heteropleuron* Kirkaldy 1895.

2. *cultellus* Peters.

Ibid. : Moreton Bay, S.Q.—Günther, *ibid.* (as *Branchiostoma cultellum*).

Figure :—Kirkaldy, *ibid.*, p. 316, pl. 34, fig. 2 (as *Heteropleuron cultellum*).

Dimensions :—To about 55 millim.

Range :—Coast of Queensland from south to north ; Islands of Torres Strait.

3. *hedleyi* Haswell.

Rec. Austr. Mus., vii, pt. 1, 9 March 1908, p. 33 (as *Heteropleuron hedleyi*).

Figure :—Haswell, *ibid.*, text-fig. 1.

Dimensions :—Of type 28 millim.

Range :—Murray Island.

Genus 3—**ASYMMETRON** Andrews, Stud. Biol. Lab. John Hopkins Univ., v, 1893, p. 237 (*lucayanum*).

4. *caudatum* Willey.

Quart. Journ. Mier. Sci., xxxix, 1896, p. 219 : Louisiade Archipelago—Haswell, *ibid.* (as *Heteropleuron-Asymmetron-lucayanum*).

Figure :—Willey, *ibid.*, pl. 13.

Dimensions :—Of type 29.5 millim.

Range :—Murray Island.

Note :—I think it advisable to follow Herdman (Cambridge Nat. Hist., vii, p. 137) in keeping the eastern and western forms of *Asymmetron* separate, until more is known about them, especially the latter.

Key to the Genera.

- a*¹. Preoral tentacles forming a continuous series ; infraoral fold continuous with the right metapleur only.
- b*¹. Gonad pouches developed on both epipleurs 1. BRANCHIOSTOMA.
- b*². Gonad pouches developed on the right epipleur only 2. EPIGONICHTHYS.
- a*². Preoral tentacles not continuous ; infraoral folds continuous with both metapleurs ; gonad pouches developed on the right epipleur only 3. ASYMMETRON.

Keys to the Australian Species.

1. BRANCHIOSTOMA :—
- a*¹. Myotomes 63 to 65 ; gonad pouches 21 to 29 1. *belcheri*.
2. EPIGONICHTHYS :—
- a*¹. A notch between the rostral and dorsal folds.
- b*¹. Myotomes 70 to 78 ; gonad pouches 26 to 31 2. *bassanus*.
- b*². Myotomes 55 ; gonad pouches 17 to 22 3. *australis*.
- a*². No notch between the rostral and dorsal folds ; myotomes 50 to 56 ; gonad pouches 17 to 20.
- c*¹. Preoral cirri 41 to 43 ; dorsal fold high 4. *cultellus*.
- c*². Preoral cirri 25 to 30 ; dorsal fold low 5. *hedleyi*.
3. ASYMMETRON :—
- a*¹. Myotomes 60 6. *caudatum*.

Class II—MARSIPOBRANCHII.

THE LAMPREYS & HAGFISHES.

Not represented in Queensland waters.

Class III—SELACHII.

Subclass A—TREMATOPNEA.

Order I—EUSELACHII. "The Sharks and Rays."⁸

Suborder *a*—PLEUROTREMATA. "The Sharks."

Division A—GALEOIDEI.

Family I—CARCHARIIDÆ. "THE NURSE SHARKS."

Genus I—**CARCHARIAS** Rafinesque, Caratt. alc. nuov. Gen., 1810, p. 10 (*taurus*). Syn.—*Triglochis* Müller & Henle, 1837; *Odontaspis*, Agassiz, 1838.⁹

1. *arenarius* Ogilby. "GRAY NURSE." Sand Shark.

Ann. Queensl. Mus., No. 10, 1 Nov. 1911, p. 37: Moreton Bay, S.Q.—Günther, Catal., viii, p. 392, part.; Macleay, Catal., 1084 part (as *Odontaspis americanus*).

Figure:—McCoy, Prodr., pl. 64, fig. 1 (as *O. taurus*).

Dimensions:—To at least 3.66 mm.

Range:—Coast of South Queensland, rare. Moreton Bay (*Ogilby*).

Type:—In the Queensland Museum. Reg. No. I. 14/1884.

⁸ From an economic point of view sharks and rays have been altogether neglected by our fishermen, nevertheless we find in them several products which might be turned to good account commercially. For instance shark fins are in general use throughout the Chinese Empire for thickening soups, etc., and I know of no reason to prevent the building up of a lucrative trade in this commodity between the two countries; an excellent isinglass is also obtainable from these fins. Again all selachians yield a large quantity of oil, which is of such proved commercial value that the capture of sharks for this purpose alone provides employment for scores of families on the ocean coasts of Europe, even though the species sought for is small, and the fishery is prosecuted by means of hand-lines worked at a depth of 200 fathoms and over. On the Pacific Coast of North America *Galeus zyopterus*, the eastern representative of our "school shark," is popularly known as the "oil-shark," because of the amount of that product which may be extracted from its liver, and there is little reason to doubt that our Australian species might be as lucratively utilized; in fact the industry was at one time in existence in Tasmania (Johnston, Proc. Roy. Soc. Tas., 1882, p. 94). In the selachians the liver is very large, that of a "tiger shark" (*Galeocerdo arcticus*) measuring 13 feet, no uncommon size, weighing no less than 275 lb. Furthermore the skin of many of the smaller sharks and rays furnishes an unrivalled shagreen, which is extensively used in the polishing of wood and marble. From their great durability and the handsome markings of many of the species, such as the "wobbeongs" (*Orectolobus spp.*), these skins would form an excellent substitute for leather, alligator skin, and the like, in the manufacture of purses, reticules, etc. They might also be advantageously employed for coating the handles of articles on which a firm hold is vitally necessary, such as the grip of a sword. For these and like purposes they would doubtless command a ready sale, while the tanned skins of the larger species should also be of marketable value. Sharks' teeth too make up into handsome brooches, scarf-pins, and similar ornaments. Doubtless other selachian remains might be made economically useful, as fertilizers for instance. In addition to these by-products the flesh of many of the smaller sharks (*Scyliorhinidae* and some *Orectolobidae*) and rays (*Rhinobatidae*, *Rajidae*, and *Dasybatidae*) is excellent, and is largely used by the inhabitants of many seaward countries. I can speak from personal experience of the good qualities of a shark (*Scyliorhinus canicula*) and three rays (*Raja clavata*, *R. batis*, and *Urolophus testaceus*). Enough, however, has been written to show that these creatures are not so worthless as many suppose.

⁹ See Ogilby, Ann. Queensl. Mus., No. 10, p. 38.

Family II—ALOPIIDÆ. "THE FOX SHARKS."

Genus 2—**ALOPIAS** Rafinesque, Caratt. alc. nuov. Gen., 1810, p. 12 (*macrourus* = *vulpinus*). Syn.—*Alopecias* Müller & Henle 1837; *Vulpecula* Garman 1913.

2. **vulpinus** Bonnaterre. "THRESHER." Fox Shark. Long-tailed Shark.
Encycl. Méth., Ichth., 1788, p. 9: "La Méditerranée" (as *Squalus vulpinus*)
—Günther, Catal., viii, p. 393; Macleay, Catal., 1085 (as *Alopecias vulpes*)—Garman, Plagiost., p. 30 (as *Vulpecula marina*).

Figures:—McCoy, Prodr., pl. 88 (as *Alopecias vulpes*)—Garman, *ibid.*, pl. 7, fig. 1.

Dimensions:—To at least 4.5 mm.

Range:—Coast of South Queensland.¹⁰

Family III—ISURIDÆ. THE "PORBEAGLES" or Mackerel Sharks.

Subfamily *a*—ISURINÆ.

Genus 3—**ISURUS** Rafinesque, Caratt. alc. nuov. Gen., 1810, p. 12 (*oxyrhynchus*). Syn.—*Oxyrhina* Müller & Henle 1837; *Isuropsis* Gill 1861.

3. **glaucus** Muller & Henle. "BLUE POINTER."
Plagiost., 1841, p. 69 (as *Oxyrhina glauca*)—Günther, Catal., viii, p. 391;
Macleay, Catal., 1082 (as *Lamna glauca*)—Garman, Plagiost., p. 38.

Figure:—Müller & Henle, *ibid.*, pl. 29.

Dimensions:—To at least 3.66 mm.

Range:—Coast of South Queensland, rare.¹¹

Subfamily *b*—CARCHARODONTINÆ.

Genus 4—**CARCHARODON** Müller & Henle, Charlesworth Mag. Nat. Hist., ii, 1838, p. 37 (*rondeletii* = *carcharias*).

4. **carcharias** Linnæus. "WHITE POINTER." Great White Shark; Maneater.
Syst. Nat., ed. 10, i, 1758, p. 235: "in Europa" (as *Squalus carcharias*)—
Günther, Catal., viii, p. 392; Macleay, Catal., 1083 (as *C. rondeletii*)—
Garman, Plagiost., p. 32.

Figures:—McCoy, Prodr., pl. 74 (as *C. rondeletii*)—Garman, *ibid.*, pl. v, fig. 1.

Dimensions:—Normally to between 3 and 4 mm. Occasionally, however, examples of much larger size are recorded, such, for instance, as one noticed by Günther¹² as having been caught many years ago at Port Fairy, Victoria, the jaws of which are now in the British Museum, and which had attained the enormous length of over 10 mm. (36.5 feet). "Forty feet and more" (*Garman*).

¹⁰ The species has not, so far as I am aware, ever been captured in Queensland waters, but it has been seen so often at close quarters as to preclude its omission from this list. Only a short time ago Messrs. Welsby and Appel, both gentlemen of wide experience, had a most interesting view of a combat in Moreton Bay between a pair of these sharks and a whale, the object of the attack being a very young calf which was accompanying the latter. So intent were the marauders on their nefarious design that they allowed the steamer to steal up within its own length of them before they sheered off into deeper water, thus permitting all on board to obtain a full and close view of both sharks and whales. On the occasion of the visit of the ill-fated "Endeavour" to this State during the winter of 1910 these sharks were seen on several occasions. I take this opportunity of recording my appreciation of the scientific value of the work done by that vessel, and my profound regret at the sad disaster which has befallen her officers and crew.

¹¹ This species is included on the evidence of a pair of jaws taken from a "small blue shark," caught at Bulwer, Moreton Bay. I know of no other Australian shark to which the jaws could belong, as the absence of denticles debars *Carcharias*.

¹² Study of Fishes, p. 321, text-fig. 114 (*a tooth*).

Range :—Coast of South Queensland, rare.¹³

Family IV—ORECTOLOBIDÆ. "THE CARPET SHARKS."

Subfamily *a*—GINGLYMOSTOMATINÆ.

Genus 5—**NEBRIUS** Rüppell, Neue Wirbelth. Abyss., Fisch., 1840, p. 62 (*concolor*). Syn.—*Nebrodes* Garman 1913.

5. **concolor** Rüppell. "TAWNY SHARK."

Ibid.: Red Sea—Günther, Catal., viii, p. 409; Regan, Proc. Zool. Soc., 1908, ii, p. 352 (as *Ginglymostoma concolor*)—Garman, Plagiost., p. 57 (as *Nebrodes concolor*).

Figure :—Garman, *ibid.*, pl. 8, fig. 7 (as *Nebrodes macrurus*).

Dimensions :—No data as to the adult, but evidently grows to a large size, as a young male from the Solomon Group, in the Australian Museum, Sydney, though measuring 1.4 mm., has the claspers but little developed.

Range :—Darnley Island (*Tosh. Coll.*).

Subfamily *b*—ORECTOLOBINÆ.

Genus 6—**ORECTOLOBUS** Bonaparte, Icon. Faun. Ital., Pesc., 1834, fasc. 7 (*barbatus* = *maculatus*). Syn.—*Crossorhinus* Müller & Henle 1837; *Eucrossorhinus* Regan 1908.

6. **ogilbyi** Regan. "TASSELED WOBEGONG."

Ann. & Mag. Nat. Hist. (8) iii, Dec. 1909, p. 529; Torres Strait—Ogilby & McCulloch, Proc. Roy. Soc. N.S.Wales, xlii, 1909, p. 272 (as *O. dasypogon*).

Figure :—Ogilby & McCulloch, *ibid.*, pl. 43, fig. 1.

Dimensions :—To at least 120 cm.

Range :—Coast of North Queensland. Dunk Island (*Ogilby*). Thursday Island (*Kent*). Torres Strait (*Macleay*).

7. **maculatus** Bonnaterre. "OCELLATED WOBEGONG." Carpet Shark.

Encycl. Méth., Ichth., 1788, p. 8: "La mer du sud" (as *Squalus maculatus*)—Regan, Proc. Zool. Soc., 1908, p. 355 (as *O. barbatus*)—Garman, Plagiost., p. 52.

Figure :—Ogilby & McCulloch, *ibid.*, pl. 42, fig. 2.

Dimensions :—To at least 110 cm.

Range :—Coast of South Queensland. Moreton Bay (*Ogilby*).¹⁴

8. **devisi** Ogilby. "BANDED WOBEGONG." Carpet Shark. Tiger Shark.

Mem. Queensl. Mus., v, 1916, p. 152—de Vis, Proc. Linn. Soc. N. S. Wales, viii, pt. 2, 17 July 1883, p. 289; Moreton Bay, S.Q. (as *Crossorhinus ornatus*)—Regan, *ibid.*, p. 289; Garman, Plagiost., p. 49.

Figure :—Ogilby & McCulloch, *ibid.*, pl. 42, fig. 1.

Dimensions :—To at least 200 cm. Said to grow much larger.

Range :—Coast of Queensland, presumably from south to north.

Type :—In the Queensland Museum; Reg. No. I. 11/164.

¹³ I include this unmistakable species on the strength of a fine specimen, from Moreton Bay, exhibited in the Fisheries Court of the Brisbane National Association's Show of 1909. This is the only authentic occurrence of which I can find any record.

¹⁴ Owing to the previous confusion between this species and the succeeding, the exact northern range of *O. maculatus* can not be definitely fixed, but it is much the rarer of the two in Moreton Bay.

9. *tentaculatus* Peters. "SOMBER WOBEGONG."

Mon. Akad. Berlin, 1864, p. 123: Port Adelaide, S.A.; Günther, Catal., viii, p. 414; Macleay, Catal., 1096 (as *Crossorhinus tentaculatus*)—Ogilby & McCulloch, *ibid.*, p. 278; Garman, *Plagiost.*, p. 51.

Figure:—Regan, *ibid.*, pl. xii, fig. 3.

Dimensions:—To at least 90 cm.

Range:—Coast of North Queensland. Cape York (*Günther*).¹⁵

Genus 7—**BRACHÆLURUS** Ogilby, Proc. Roy. Soc. Queensl., xx, 30 Sept. 1907, p. 27 (*modestus*). Syn.—*Cirriscyllium* Ogilby 1908.

10. *modestus* Günther. "BLIND SHARK."

Proc. Zool. Soc., 1871, p. 654; Macleay, Catal., 1093 (as *Chiloscyllium modestum*)—Macleay, *ibid.*, 1094 (as *C. furvum*)—Regan, *ibid.*, p. 354; Ogilby & McCulloch, *ibid.*, p. 281.

Figures:—Günther, *ibid.*, pl. 54; Waite, Rec. Austr. Mus., iv, pl. 4, fig. 1 (*fetus*) (as *Hemisicyllium modestum*).

Dimensions:—To at least 90 cm.

Range:—Coast of South Queensland.

Genus 8—**HETEROSCYLLIUM** Regan, Ann. & Mag. Nat. Hist. (8) ii, Nov., 1908, p. 455 (*colcloughi*). Syn.—*Brachælurus* Ogilby 1908, by an oversight.

11. *colcloughi*. "BLUE-GRAY SHARK."

Proc. Roy. Soc. Queensl., xxi, 25 Aug. 1908, p. 4: Moreton Bay (as *Brachælurus colcloughi*)—Ogilby & McCulloch, *ibid.*, p. 284.

Unfigured.

Dimensions:—Of type, a young male, 457 millim.

Range:—Coast of South Queensland. Moreton Bay (*Ogilby & Q.M., O.C.*).

Type:—Accidentally destroyed.

Genus 9—**CHILOSCYLLIUM** Müller & Henle, Arch. f. Nat., 1837, i, p. 395 (*plagiosum*). Syn.—*Hemisicyllium* Müller & Henle 1838.

12. *ocellatum* Bonnaterre. "EPAULETTE SHARK."

Encycl. Méth., Ichth., 1788, p. 8; "La mer du sud" (as *Squalus ocellatus*)—Günther, Catal., viii, p. 410; Macleay, Catal., 1091; Regan, *ibid.*, p. 398; Ogilby & McCulloch, *ibid.*, p. 290—Garman, *Plagiost.*, p. 44 (as *Hemisicyllium ocellatum*).

Figure:—Shaw, Nat. Misc., pl. 161.

Dimensions:—To at least 90 cm.

Range:—Coasts of Middle and North Queensland, common about coral reefs. Masthead Island (*McCulloch*). Nor-West Islet (*Endeavour Coll.*). Dunk Island and

¹⁵ McCulloch, under date 9-v-14, writes: "I do not believe that the Cape York and the South Australian specimens belong to the same species, though as I have no decent specimens of either I am not in a position to prove my point." With this opinion I am inclined to agree. We know that *O. tentaculatus* occurs on the coast of South Australia, because not only did Peters' type come from Port Adelaide, but the Australian Museum possesses a specimen from the same place (v. Ogilby, Proc. Linn. Soc. N. S. Wales, xiv, p. 182). But there is an alternative proposition in the possibility of the label on Herr Dämel's examples, on the authority of which alone the Queensland locality rests, having been accidentally changed. If both the records are correct it is exceedingly strange that the species has never been recorded from any intermediate station on either coast of Australia. Under the circumstances, however, I do not see my way clear to erase the name from our list, even though its reputed habitat has been fairly well exploited without yielding further evidence in favour. In face of these facts Garman omits all mention of the authenticated South Australian locality and gives the distribution of the species as "Queensland" only.

Green Island, Cairns (*Ogilby*). Hope and Murray Islands (*McCulloch*). Cape York and Torres Strait (*Macleay*).

13. **trispeculare** Richardson. "SPECKLED SHARK."

Icon. Pisc., 1843, p. 5: Turtle Island; Garman, *Plagiost.*, p. 45 (as *Hemiscyllium trispeculare*)—Günther, *Catal.*, viii, p. 411; Macleay, *Catal.*, 1092; Regan, *ibid.*, p. 359; Ogilby & McCulloch, *ibid.*, p. 293.

Figure :—Richardson, *Zool. Erebus & Terror, Ichth.*, pl. 28.

Dimensions :—No data; type, a male of 560 millim.

Range :—Coast of North Queensland. Turtle Island, Gulf of Carpentaria (*Richardson*)¹⁶; Cape York (*Günther*).¹⁷

14. **punctatum** Müller & Henle. "BROWN-BANDED SHARK."

Plagiost., 1841, p. 18: Java; Günther, *Catal.*, viii, p. 413; Regan, *ibid.*, p. 360; Garman, *Plagiost.*, p. 61.

Figures :—Müller & Henle, *ibid.*, pl. 3; Ogilby & McCulloch, *ibid.*, text-fig. 1, p. 289 (*egg-case*) and pl. 43, fig. 2 (*fetus*).

Dimensions :—No reliable data as to adult. Garman alludes to a male of 660 millim. in which the claspers "are very small and immature," and naturally concludes, as indeed Ogilby & McCulloch had previously suggested, that "this is probably a species of which individuals reach a considerable size." As regards our South Queensland species it must however, be admitted that this supposition is somewhat discounted by the small size of the egg-case, which rarely exceeds 100 millim. in length by 52 in. breadth. It is possible that we may be confounding two species, of which the Malayan form may attain a much greater size than this Moreton Bay shark, which we know only from its egg-case and fetus, and of which the adult so tantalizingly eludes our search.

Range :—Coast of Queensland from south to north. Moreton Bay and Dunk Island (*Ogilby & McCulloch*), the latter on the evidence of empty egg-cases only, as also Hervey Bay (*Endeavour Coll.*). Thursday Island (*Regan*).

Genus 10—**STEGOSTOMA** Müller & Henle, *Arch. f. Nat.*, 1837, i, p. 395 (*fasciatum* = *tygrinum*).

15. **tygrinum** Bonnaterre. "ZEBRA SHARK."

Encycl. Méth., *Ichth.*, 1788, p. 8: "La mer des Indes" (as *Squalus tygrinus*)—Günther, *Catal.*, viii, p. 409; Regan, *ibid.*, p. 364 (as *Stegostoma tigrinum*)—Ogilby & McCulloch, *ibid.*, p. 295; Ogilby, *Mem. Queensl. Mus.*, iii, Garman, *Plagiost.*, p. 59 (as *S. varium*).

Figure :—Day, *Fish. India*, pl. 187, fig. 4.

Dimensions :—To at least 3.6 mm.

Range :—Coast of Queensland presumably from south to north.¹⁸ Cape Bowling Green (*Hamlyn Harris Coll.*). Dunk Island (*Ogilby*). Little Mulgrave River (*McCulloch*). Cape York and Normanton (*Ogilby*).

Family VI—SCYLIORHINIDÆ. "THE CAT SHARKS."

Genus 11—**HALÆLURUS** Gill, *Ann. Lyc. Nat. Hist. New York*, vii, 1861, p. 407 (*bürgeri*).

16. **labiosus** Waite. "BLACK-SPOTTED CAT SHARK."

Rec. Austr. Mus., vi, pt. 2, 15 Sept. 1905, p. 57: Freemantle, W.A. (as *Catulus labiosus*)—Günther, *Catal.*, viii, p. 401; Macleay, *Catal.*, 1087 (as *Scyllium maculatum*)—Garman, *Plagiost.*, p. 88.

¹⁶ See Ogilby, *Mem. Queensl. Mus.*, iii, p.

¹⁷ *Ann. & Mag. Nat. Hist.* (3) xx, p. 67.

¹⁸ Though all our Queensland records come from the northern division of the State, it occurs as far south as Port Jackson.

Figure :—Waite, *ibid.*, text-fig. 23 (*under surface of head*).

Dimensions :—To at least 620 millim.

Range :—North Coast of Queensland. Bramble Cay, N.Q. (*Brit. Mus.*). There is a scyliorhinoid egg-case in the State Museum collected at Cape York by Mr. Kendal Broadbent, which probably belongs to this species.

Family VI—GALEIDÆ.

Subfamily *a*—MUSTELINÆ. “THE HOUNDS.”

Genus 12—**MUSTELUS** Linck, *Mag. neue Phys. u. Nat.* vi, 1790, p. 31 (*mustelus*).
Syn.—*Pleuracromylon* Gill 1864 (species with placenta); *Cynias* Gill 1903 (species without placenta).

17. **antarcticus** Günther. “GUMMY.” Smooth Hound.

Catal., viii, p. 387: New South Wales, etc.; Macleay, *Catal.* 1081; Waite, *Rec. Canterb. Mus.*, i, p. 140—Garman, *Plagiost.*, p. 175 (as *Galeorhinus antarcticus*).

Figures :—Waite, *Rec. Austr. Mus.*, iv, text-fig. 19, p. 177 (*fetus*) (as *Galeus antarcticus*)—McCulloch, *Rec. Austr. Mus.*, vii, pl. 90, fig. 3 (*adult*).

Dimensions :—To at least 105 cm.

Range :—Coasts and estuaries of South Queensland, not uncommon. Southport, Moreton Bay, Brisbane River, Great Sandy Strait (*Ogilby*). Point Lookout in 31 fath. (*Endeavour Coll.*).

Subfamily *b*—GALEINÆ. “THE TOPES.”

Genus 13—**GALEUS** Rafinesque, *Caratt. alc. nuov. Gen.*, 1810, p. 13 (*galeus*; type by suggestion). Syn.—*Galeorhinus* Blainville 1816.

18. **australis** Macleay.¹⁹ “SCHOOL SHARK.” Tope.

Proc. Linn. Soc. N. S. Wales, vi, pt. 2, 12 Sept. 1881, p. 354: Port Jackson, N.S.W.; *id.*, *Catal.*, 1079; Waite, *Rec. Canterb. Mus.*, i, p. 139; *Ogilby*, *Proc. Roy. Soc. Queensl.*, xxi, p. 23.

Figure :—McCoy, *Prodr.*, pl. 64, fig. 2.

Dimensions :—To at least 180 cm.

Range :—Coast of South Queensland, rare. Moreton Bay (*Ogilby*).

Genus 14—**GALEOCERDO** Müller & Henle, *Arch. f. Nat.*, 1837, i, p. 398 (*arcticus*).

19. **arcticus** Faber. “TIGER SHARK.”

Naturg. Fisch. Islands, 1829, p. 17: Iceland (as *Squalus arcticus*)—Günther, *Catal.*, viii, p. 377; Garman, *Plagiost.*, p. 148—Günther, *ibid.*; Macleay, *Catal.*, 1078 (as *G. rayneri*).

Figures :—Müller & Henle, *Plagiost.*, pl. 24—McDonald & Barron, *Proc. Zool. Soc.*, 1868, pl. 32.

Dimensions :—To at least 4.5 mm.

¹⁹ Very closely allied to, if not identical with, *G. galeus*.

Range :—Coasts and estuaries of Queensland from south to north, common.²⁰

Subfamily *c*—CARCHARHININÆ. "THE BLUE SHARKS."

Genus 15—**PHYSODON** Müller & Henle, *Plagiost.*, 1841, p. 30 (*mülleri*).

20. *mülleri* Müller & Henle.

Ibid. : Bengal ; Günther, *Catal.*, viii, p. 360 ; Macleay, *Catal.*, 1072 (as *Carcharias mülleri*)—Garman, *Plagiost.*, p. 108.

Figure :—Müller & Henle, *ibid.*, pl. xix, fig. 1 (*dentition*).

Dimensions :—No data.

Range :—Coast of North Queensland. Cape York (*Macleay*). Specimen in the University Museum, Sydney.

21. *taylori* Ogilby.

Mem. Queensl. Mus., iii, 1915, p. 117 : Townsville.

Unfigured.

Dimensions :—Of type 657 millim.

Range :—Coast of North Queensland.

Type :—In the Queensland Museum. Reg. No. I. 12/738.

Genus 16—**SCOLIODON** Müller & Henle, *Arch. f. Nat.*, 1837, i, p. 397 (*laticaudus*).

22. *jordani* Ogilby.

Proc. Roy. Soc. Queensl., xxi, 1909, p. 88 (adv. copy 25 Aug. 1908) : Caloundra.

Unfinished.

Dimensions :—Of type 850 millim.

Range :—Coast of South Queensland.

Type :—Accidentally destroyed.

23. *affinis* Ogilby.

Mem. Queensl. Mus., i, 27 Nov. 1912, p. 29 ; Noosa Head.

Unfigured.

Dimensions :—Of type 526 millim.

Range :—Coast of South Queensland.

Type :—In the Queensland Museum, by favour of the Amateur Fishermen's Association of Queensland. Reg. No. I. 13/1526.

²⁰ The most cunning and dangerous of all our sharks, lurking about wharves and similar places, where they pick up an easy living through the refuse thrown overboard from the vessels alongside, together with an occasional dog or other animal. When on board the "Endeavour" we were witnesses to a remarkable instance of gluttony and its fitting reward. While a brace of snapper was being hauled up a large shark of this species was observed to be accompanying them from the bottom ; instead, however, of tearing them from the hook, as is the usual practice in such cases, it contented itself with merely nosing them about, not even making any more vigorous protest when they were finally lifted intact out of the water. As it persisted in continuing this form of amusement with other captures, we throw out a shark hook nicely baited with fat pork, which it soon found. Even this tempting morsel it only nosed and mumbled for several minutes before taking it into its mouth so far as to enable us to effect its capture. When opened the secret of its extraordinary behaviour was revealed, for it was found to be full actually to the gullet with large leather-jackets (*Cantherines ayraudi*), of which it had already swallowed no less than 32, averaging fully fifteen inches apiece, all of which were perfectly fresh, unbiten, and undigested. This shark measured over 13 feet.

24. *acutus* Rüppell.

Neue Wirbelth. Abyss., Fisch., 1837, p. 65: Red Sea; Günther, Catal., viii, p. 358; Ogilby, Proc. Linn. Soc. N. S. Wales, xiii, p. 1766 (as *Carcharias acutus*)—Garman, plagiost. p. 111 (as *S. palasorrah*).

Figure:—Day, Fish. India, pl. 188, fig. 2.

Dimensions:—To at least 750 millim. Said to attain a considerable size (*Day*).

Range:—Coast of Queensland, south to the Burnett River Heads, S.Q. (*Ogilby*).

Specimen in the Australian Museum, Sydney.

25. *longmani* Ogilby.

Mem. Queensl. Mus., i, 27 Nov. 1912, p. 30: Moreton Bay, S.Q.

Unfigured.

Dimensions:—Of type 526 millim.

Range:—Coast of S. Queensland.

Type:—In the Queensland Museum. Reg. No. I. 12/292.

Genus 17—*Aprionodon* Gill, Ann. Lyc. Nat. Hist. New York, vii, 1861, p. 411 (*punctatus*=*isodon*). Syn.—*Aprion* Müller & Henle 1841; not of Cuvier & Valenciennes 1830.

26. *acutidens* Rüppell.

Neue Wirbelth. Abyss., Fisch., 1837, p. 65; Günther, Catal., viii, p. 361; Macleay, Catal., 1071 (as *Carcharias acutidens*)—Garman, Plagiost., p. 118.

Figure:—Rüppell, *ibid.*, pl. 18, fig. 3.

Dimensions:—To at least 183 cm. (*Day*).

Range:—Coast of North Queensland. Torres Strait (*Macleay*). Specimen in the University Museum, Sydney.

Genus 18—*RHIZOPRION* Ogilby, Mem. Queensl. Mus., iii, 1915, p. 132 (*crenidens*).

27. *crenidens* Klunzinger.

Sitz. Akad. Wien, lxxx, 1879, i, p. 426: Coast of Queensland; Macleay, Catal., 1284 (as *Carcharias crenidens*).

Figure:—Klunzinger, *ibid.*, pl. 8, fig. 3 (*dentition*).

Dimensions:—To at least 850 millim.

Range:—Coast of South Queensland. Moreton Bay (*Ogilby*). Cape Moreton, 73 fath.; Double Island Point, 33 fath., 29 spec.; Roeky Island Reef (*Endeavour Coll.*).²¹

Genus 19—*CARCHARHINUS* Blainville, Bull. Soc. Philom., 1816, p. 121 (*commersonii*). Syn.—*Carcharias* Cuvier 1817, not of Rafinesque 1810 (q.v., p. 73).

28. *stevensi* Ogilby.

Ann. Queensl. Mus., No. 10, 1 Nov. 1911, p. 38: Bustard Bay.

Unfigured.

Dimensions:—To about 2 mm.

Range:—Coasts of South and Middle Queensland. Bustard Bay, S.Q. and Nor-West Islet, M.Q. (*Ogilby*).²²

²¹ This is the most common of the smaller galeids on our southern coast, and has the right to inclusion in the New South Wales fauna, the "Endeavour" having trawled a specimen off Cape Byron.

²² In the original description the lengths of the specimens examined are given as 164 and 187 millim. This should read "cm."

29. *amblyrhynchos* Bleeker.

Nat. Tijds. Nederl. Ind., x, 1856, p. 467 (as *Carcharias-Prionodon-amblyrhynchos*.)

Unfigured.

Dimensions:—No data.

Range:—Coast of North Queensland. Cape Bowling Green (*Ogilby*).

30. *melanopterus* Quoy & Gaimard.

Voy. Uranie, Zool., 1824, p. 194: Waigiou; Günther, Catal., viii, p. 369; Macleay, Catal., 1077; *Ogilby*, Proc. Roy. Soc. Queensl., xxi, p. 88 (as *Carcharias melanopterus*)—Garman, Plagiost., p. 134.

Figure:—Jordan & Evermann, Bull. U.S. Fisher. Comm., xxiii, pl. 1.

Dimensions:—To at least 3.66 mm.

Range:—Coast of Queensland from south to north. Snapper Banks off Moreton Bay, S.Q. (*Ogilby*). Nor-West Islet, M.Q. (*Endeavour Coll.*). Darnley Island (*Tosh Coll.*).

31. *spenceri* *Ogilby*. "ESTUARY SHARK."

Proc. Roy. Soc. Queensl., xxiii, 1911, p. 3 (adv. cop. 7 Nov. 1910): Brisbane River.

Unfigured.

Dimensions:—To at least 2.2 mm.

Range:—Coasts and estuaries of South and Middle Queensland. Moreton Bay, Brisbane River, and Great Sandy Strait, S.Q. (*Ogilby*). Old Woman Island and Hervey Bay, S.Q., and Rocky Island Reef, M.Q. (*Endeavour Coll.*).²³

Subfamily *d*—CESTRACIONINÆ. "THE HAMMER-HEADED SHARKS."

Genus 20—**CESTRACION** Walbaum, Artedi Genera, 1792, p. 580 (*zygæna*). Syn.—*Sphyrna* Rafinesque 1810; *Zygæna* Cuvier 1817.

Subgenus *a*—EUSPHYRA Gill, Ann. Lye. Nat. Hist. New York, vii, 1861, p. 412 (*blochii*).

32. *blochii* Cuvier.

Règne Anim., ii, 1817, p. 127: Indian Seas; Günther, Catal., viii, p. 380 (as *Zygæna blochii*)—*Ogilby*, Ann. Queensl. Mus., No. 9, p. 4 (as *Sphyrna blochii*)—Garman, Plagiost., p. 156.

Figure:—Day, Fish. India, pl. 184, fig. 4.

Dimensions:—To at least 150 cm.; "attains to a very large size." (*Day*, from the reports of fishermen).

Range:—Coast of North Queensland. Rockingham Bay (*Ogilby*).

Subgenus *β*—CESTRACION Walbaum, *v. supr.*

33. *lewini* Lord. "AUSTRALIAN HAMMERHEAD."

In Griffith's Anim. Kingd., x, 1834, p. 640 (as *Zygæna lewini*)—Waite, Mem. Austr. Mus., iv, 1899, p. 34 (as *Sphyrna lewini*).

Figure:—McCoy, Prodr., pl. 56, fig. 1 (as *Zygæna malleus*).

Dimensions:—To at least 3.66 millim.

Range:—Coast of South Queensland. Moreton Bay (*Q.M.*).

²³ This is the common estuary shark of our rivers, and has been known to follow shoals of fishes well beyond the tideway. A specimen 159 cm. long contained 8 fetus, each of which measured from 43 to 47 cm., or an average of two sevenths of the total length of the mother.

Subgenus γ —**PLATYSQUALUS** Swainson, *Classif. Fish.*, ii, 1839, p. 318 (*tudes*).

34. **tudes** (Cuvier MS).

Valenciennes, *Mém. Mus. Hist. Nat.*, ix, 1822, p. 225; Günther, *Catal.*, viii, p. 332 (as *Zygaena tudes*)—Ogilby, *Ann. Queensl. Mus.*, No. 9, p. 4 (as *Sphyrna tudes*)—Garman, *Plagiost.*, p. 159.

Figure :—Day, *Fish. India*, pl. 188, fig. 4.

Dimensions :—To at least 3.33 mm.

Range :—Coasts and estuaries of Queensland, presumably from south to north. Tweed Heads, Moreton Bay, Cabbage-tree Creek, and Brisbane River (*Ogilby*). South Hill and Double Island Point—all S.Q.—(*Endeavour Coll.*).²⁴

Division B—**SQUALOIDEI**.

Family VII—**HETERODONTIDÆ**. “THE BULLHEAD OF PORT JACKSON SHARKS.”

Genus 21—**HETERODONTUS** Blainville, *Bull. Soc. Philom.*, 1816, p. 121 (*phillipi*). *Syn.*—*Cestracion* Cuvier 1817, not of Walbaum 1792 (q.v., p. 81).

35. **phillipi** Schneider.²⁵ “PORT JACKSON SHARK”; Common Bullhead; Low-crowned Bullhead. Oyster-crusher, Pigfish, and Bulldog Shark (*Kent*).

In Bloch, *Syst. Ichth.*, 1801, p. 134: Botany Bay (as *Squalus philippi*)—Günther, *Catal.*, viii, p. 415 (as *Cestracion philippi*)—Maclay & Macleay, *Proc. Linn. Soc. N. S. Wales*, iii, p. 309—Garman, *Plagiost.*, p. 182 (as *Centracion philippi*).

Figures :—Maclay & Macleay, *ibid.*, pls. 22-24; McCoy, *Prodr.*, pl. 113; Kent, *Natur. in Austr.*, text-fig. p. 194.

Dimensions :—To at least 140 cm.

Range :—Coast of South Queensland. Moreton Bay (*Kent*).²⁶

Genus 22—**GYROPLEURODUS** Gill, *Proc. Acad. Nat. Sci. Phila.*, 1862, p. 489 (*francisci*).

36. **galeatus** Günther. “CRESTED BULLHEAD.”

Brit. Mus. Catal. Fish., viii, 1870, p. 416: Australia (as *Cestracion galeatus*)—Maclay & Macleay, *ibid.*, p. 313 (as *Heterodontus galeatus*)—Ogilby, *Proc. Linn. Soc. N. S. Wales*, xx, p. 245, description of teeth (as *Gyropleurodus sp.*)—Garman, *Plagiost.*, p. 185 (as *Centracion galeatus*).

²⁴ This is much the most common hammerhead in Moreton Bay; the young ascend our rivers to the limit of the tideway.

²⁵ Orthographically corrected to assimilate it to the name of Governor Phillip, after whom it was called.

²⁶ The only knowledge I possess of the occurrence of this shark in Queensland waters has been gained through the following sentence published on page 193 of Mr. Saville Kent's “Naturalist in Australia.” It “has been met with by the writer at such remote localities as Tasmania, Moreton Bay in Queensland, and Fremantle in Western Australia.” Relying probably upon this statement Garman gives its habitat as “Queensland, Southern Australia, and New Zealand.” In the seas of the latter it does not occur. It is quite unknown to me as a native of our seas, nor can I gain any confirmative evidence of its existence from the conversation of prominent fishermen both professional and amateur. As there is no local specimen in the State Museum Kent did not apparently consider it worth while to preserve his specimens. As a matter of fact I am very sceptical as to its occurrence in Moreton Bay, but in view of the explicit declaration quoted above I can not very well omit it. See also his “Great Barrier Reef,” p. 267.

Figures :—Maclay & Macleay, *ibid.*, pl. 25 ; Waite, *Mem. Austr. Mus.*, iv, pl. 1 (*dentition*).

Dimensions :—To fully 110 cm.

Range :—Coast of South Queensland. Tweed Heads (*Ogilby*). This is a more northern species than the preceding and I was not, therefore, much astonished at learning of the capture of a specimen north of the Tweed, and the less so that the "Endeavour" trawled a fine example off Byron Bay. Further proof of its more northern range, as compared with *H. phillipi*, may be found in Waite's report that while the "Thetis" trawled that species at 14 stations between Shoalhaven Bight and Cape Hawke, not a single specimen of *G. galeatus* was taken.²⁷

Suborder *b*—HYPOTREMATA. "The Rays."

Family VIII—NARCACIONIDÆ.²⁸ "THE ELECTRIC RAYS."

Genus 23—**HYPNOS** Duméril, *Rev. & Mag. Zool.*, 1852, p. 277 (*subniger*).
Syn.—*Hypmarce* Waite 1902.

37. **subniger** Duméril. "NUMBFISH." Crampfish. Nummy (*Stead*).

Ibid., p. 279 : West Australia ; Günther, *Catal.*, viii, p. 453 ; Macleay, *Catal.*, 1113—Garman, *Plagiost.*, p. 304 (as *Hypmarce subnigrum*).

Figure :—Duméril, *ibid.*, pl. 12.

Dimensions :—To about 70 cm.

Range :—Coast of South Queensland. Moreton Bay (*Q.M.*) ; South Hill (*A.F.A.Q.*).

Division D—BATOIDEI. "The True Rays."

Subdivision SARCURA. "The Thick-tailed Rays."

Family IX—PRISTEIDÆ.²⁹ "THE SAWFISHES."

Genus 24—**PRISTIS** Linck, *Mag. neues Phys. u. Naturg.*, vi, 1790, p. 31 (*pristis*).

38. **zysron** Bleeker.

Nat. Tijds. Nederl. Ind., ii, 1851, p. 442 : Banjermassin ; Günther, *Catal.*, viii, p. 438 ; Macleay, *Catal.*, 1106 ; Garman, *Plagiost.*, p. 262.

Figure :—Day, *Fish. India*, pl. 191, fig. 2.

Dimensions :—To at least 6 mm.

Range :—Coast of Queensland from south to north.

²⁷ Waite, *ibid.*, p. 31.

²⁸ If Houttuyn's "Nat. Hist., 1764" be binomial, as is his 1782 work, these should respectively be *Torpedinoidei* and *Torpedinidæ*.

²⁹ The name is derived from the Greek *πρίστis*, gen. *πρίστειος*, "a large kind of fish," and the family name should, therefore, by the laws of nomenclature be as above ; see

39. **microdon** Latham.

Trans. Linn. Soc. London, ii, 1794, p. 280 ; Garman, Plagiost., p. 265—
Günther, Catal., viii, p. 436 (as *P. perotteti*)—Ogilby, Ann. Queensl.
Mus., No. 9, p. 4 (as *P. zephyreus*).

Figures :—Latham, *ibid.*, pl. 26, fig. 4 (*rostrum*)—Day, Fish. Ind., pl. 191, fig. 1 (as *P. perotteti*).

Dimensions :—To fully 4.6 millim.

Range :—Coast of Queensland presumably from south to north. Moreton Bay (*Ogilby*).

40. **clavata** Garman.

Bull. Mus. Comp. Zool., xlv, 1906, p. 208 : Coast of Queensland.

Figure :—Garman, Plagiost., pl. xvi, fig. 5.

Dimensions :—No data.

Range :—Coast of Queensland.

Family X—RHINOBATIDÆ. “THE GUITAR-FISHES.”

Subfamily *a*—RHAMPHOBATINÆ.

Genus 25—**RHAMPHOBATIS** Gill, Ann. Lyc. Nat. Hist. New York, vii, 1861,
p. 408 (*ancylostoma*). Syn.—*Rhina* Schneider 1801, not of Walbaum
1792.

41. **ancylostoma** Schneider.

Bloch, Syst. Ichth., 1801, p. 352 : Coromandel Coast ; Ogilby, Ann. Queensl.
Mus., No. 9, p. 4 (as *Rhina ancylostoma*)—Günther, Catal., viii, p. 440
(as *Rhynchobatus ancylostomus*)—Garman, Plagiost., p. 267.

Figure :—Day, Fish. India, pl. 193, fig. 3.

Dimensions :—To at least 215 cm.

Range :—Coast of Queensland from north to south. Moreton Bay (*Ogilby*).
Dunk Island (*Banfield*).

Genus 26—**RHYNCHOBATUS** Müller & Henle, Arch. f. Nat., 1837, i, p. 399
(*lævis* = *djiddensis*).

42. **djiddensis** Forskal.

Descr. Anim., 1775, p. 18 : Jeddah (as *Raja djiddensis*)—Günther, Catal.,
viii, p. 441 ; Ogilby, Proc. Linn. Soc. N. S. Wales, x, p. 465 ; Garman,
Plagiost., p. 268.

Figure :—Day, Fish. India, pl. 192, fig. 1.

Dimensions :—To fully 215 cm.

Range :—Coast of Queensland from south to north. Moreton Bay (*Ogilby*).
Cartwright Point, S.Q. and Nor-West Islet, M.Q. (*Endeavour Coll.*).

Subfamily *b*—RHINOBATINÆ.

Genus 27—**RHINOBATUS** Walbaum, Artedi Gen., 1792, p. 581 (*rhinobatus*).
Syn.—*Syrrhina* Müller & Henle 1841.

43. *armatus* Gray. "SHOVELNOSE SHARK." (Text-fig. 1.)

In Hardwicke's *Illustr. Ind. Zool.*, ii, 1834, pl. xcix; Müller & Henle, *Plagiost.*, p. 119.

Figure :—ut supra.

Dimensions :—To at least 150 cm.

Range :—Coast of Queensland from south to north.³⁰

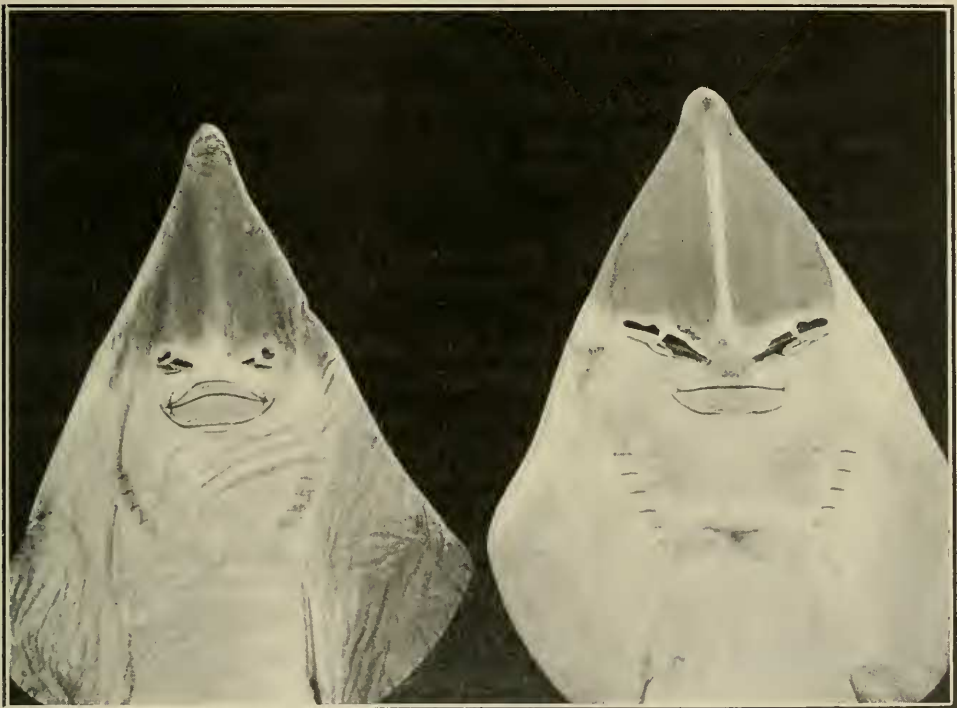
44. *banksii* Müller & Henle. (Text-fig. 2.)

Plagiost., 1841, pp. 123, 192 : New Holland ; Günther, *Catal.*, viii, p. 446 ; Macleay, *Catal.*, 1108—Ogilby, *Proc. Linn. Soc. N. S. Wales*, x, p. 464 (as *R. bougainvillii*)—Garman, *Plagiost.*, p. 278 (as *R. philippi*). Not Müller & Henle.

Figure :—Waite, *Mem. Austr. Mus.*, iv, pl. 3.

Dimensions :—To fully 125 cm.

Range :—Coast of South Queensland, straying beyond the Tropic. South Hill, Moreton Bay, Cartwright Point, Low Bluff, Double Island Point, Hervey Bay, Platypus Bay, and Bustard Bay, S.Q. ; Hummocky Island, M.Q. ; in 7 to 24 fath. (*Endeavour Coll.*).



Text-figure 1.—Genus RHINOBATUS.

R. banksii.

R. armatus.

³⁰ A much more littoral species than the succeeding, freely entering and even permanently residing and breeding in fresh water. This species was not once taken by the "Endeavour" on the Queensland Coast, whereas *R. banksii* occurred on 11 occasions.

Family XI—RAJIDÆ. "THE SKATES."

Genus 28—**RAJA** Linnæus, Syst. Nat., ed. 10, i, 1758, p. 231 (*batis*).

45. **polyommata** Ogilby.

Some new Queensl. Fish., 20 Dec. 1910, p. 86 : Cape Moreton, S.Q.

Dimensions :—To at least 320 millim.

Range :—Coast of South Queensland. Cape Moreton to North Reef in 70 to 75 fath. (*Ogilby*).

46. **australis** Macleay.

Proc. Linn. Soc. N. S. Wales, viii, pt. 4, 21 Feb. 1884, p. 461 : Off South Head, Botany Bay, N.S.W., in 40 to 55 fath. ; Waite, Mem. Austr. Mus., iv, p. 40.

Figure :—Waite, *ibid.*, pl. 4.

Dimensions :—To about 500 millim.

Range :—Coast of South Queensland. Cape Moreton (*A.F.A.Q. Coll.*).

Subdivision MASTICURA. "The Whip-tailed Rays."

Family XII—DASYBATIDÆ.

Subfamily *a*—UROLOPHINÆ. "THE STINGAREES."

Genus 29—**UROLOPHUS** Müller & Henle, Arch. f. Nat. 1837, i, p. 400 (*cruciatus*). Syn.—*Trygonoptera* Müller & Henle 1841.³¹

47. **testaceus** Müller & Henle.³²

Plagiost., 1841, p. 174 : New Holland ; Garman, Plagiost., p. 410 (as *Trygonoptera testacea*)—Günther, Catal., viii, p. 486 ; Macleay, Catal., 1121.

Figure :—Müller & Henle, *ibid.*, pl. 57 ; Tosh, Mar. Biol. Rep., pl. 5, fig. 3.

Dimensions :—Width of disk to 30 cm.

Range :—Coast of South Queensland. Jumpin Pin (*Tosh*). Cape Moreton (*Q.M., O.C.*). South Hill, Cape Moreton, Low Bluff, and Double Island Point (*Endeavour Coll.*).

³¹ Waite's discovery of a dorsal fin in fetal *U. cruciatus* (Mem. Austr. Mus., iv, p. 43) does away with the last shred of reason for the subdivision of this genus.

³² I have little faith in Günther's (Brit. Mus. Catal. Fish., viii, p. 351) Cape Upstart record of this species. In the Moreton Bay District *U. testaceus* is mainly a deep-water ray ; not once has it been obtained inside Moreton Bay, though it is the most abundant species captured in Port Jackson and the estuaries of the rivers of Middle New South Wales. Of the 113 examples trawled at four stations by the "Endeavour" no less than 92 were taken in one haul at a depth of 73 fath. off Cape Moreton in company with *Raja polyommata*, *Lophiomus laticeps*, and other deep-water forms, but it was absent from the two hauls off North Reef in 70 and 75 fath. respectively. Off Double Island Point, which lies about midway between Cape Moreton and North Reef, a single example was trawled in 33 fath., this being the most northerly station at which it was observed. That it should be found as a littoral species so far to the north as Cape Upstart, requires confirmation.

Subfamily *b*—DASYBATINÆ.Genus 30—**TÆNIURA** Müller & Henle, Arch. f. Nat., 1837, i, p. 400 (*lymma*).48. **lymma** Forskal. "LESSER FANTAIL RAY."

Deser. Anim., 1775, p. 17: Jeddah (as *Raja lymma*)—Günther, Catal., viii, p. 483; Ogilby, Proc. Linn. Soc. N. S. Wales, x, p. 463; Garman, Plagiost., p. 309.

Figures:—Lesson, Voy. Coquille, Zool., ii, pl. 3 (as *Trygon halgani*)—Müller & Henle, Plagiost., pl. 55, fig. 3 (*under side of head*).

Dimensions:—Width of disk to about 300 millim.

Range:—Coast of North Queensland. Green Island, Cairns (*Hamlyn Harris Coll.*). Cape York (*Ogilby*). Darnley Island (*Tosh Coll.*).

49. **mortoni** Macleay.³³

Proc. Linn. Soc. N. S. Wales, viii, pt. 2, 17 July 1883, p. 212.: Lower Burdekin River, N.Q.

Unfigured.

Dimensions:—No data.

Range:—Coast of North Queensland. Lower Burdekin River (*Macleay*).

Genus 31—**HYPOLOPHUS** Muller & Henle, Arch. f. Nat., 1837, i, p. 400 (*sephen*).50. **sephen** Forskal. "GREAT FANTAIL RAY."

Deser. Anim., 1775, p. 18: Jeddah (as *Raja sephen*)—Günther, Catal., viii, p. 482; Macleay, Proc. Linn. Soc. N. S. Wales, viii, p. 212 (as *Trygon sephen*)—Garman, Plagiost., p. 385 (as *Dasybatus sephen*).

Figure:—Day, Fish. India, pl. 195, fig. 2.

Dimensions:—Width of disk to at least 180 cm.

Range:—Coast of Queensland from south to north. Moreton Bay, S.Q. (*Q.M., O.C.*). Lower Burdekin River, N.Q. (*Macleay*).

Genus 32—**DASYBATUS** Walbaum, Artedi Gen. Pisc., 1792, p. 581 (*pastinaca*).

Syn.—*Dasyatis* Rafinesque 1810; *Trygon* Adanson 1817.

51. **kuhlii** Müller & Henle. "BLUE-SPOTTED STING RAY."

Plagiost., 1841, p. 164; Günther, Catal., viii, p. 479 (as *Trygon kuhlii*)—Garman, Plagiost., p. 395.

Figures:—Day, Fish. India, pl. 193, fig. 2; Tosh, Mar. Biol. Rep., pl. v, fig. 1.

Dimensions:—Width of disk to at least 350 millim.

Range:—Coasts and estuaries of Queensland from south to north. Coolangatta, Currumbin, Nerang Creek, Moreton Bay, and Brisbane River, S.Q. (*Ogilby*). Hervey Bay and Port Curtis, S.Q., Nor-West Islet and Edgecumbe Bay, M.Q. (*Endeavour Coll.*).

³³ Without having seen either the one or the other Prof. Garman unites this species with *T. atra* Macleay from New Guinea. I labour under the same disadvantage, but before accepting his determination I must be satisfied that a ray, having the "head and body covered with small nitid granules" (*atra*), can possibly be identical with one which has the "disk covered with close minute spines" (*mortoni*). The difference may be sexual, but that is highly improbable.

52. *fluviorum* Ogilby. "ESTUARY RAY."

Proc. Roy. Soc. Queensl., xxi, 25 Aug. 1908, p. 6 : Brisbane River ; Garman, Plagiost., p. 394—Kent, Great Barrier Reef, p. 267 (as *Trygon pastinaca*).

Figure :—Tosh, Mar. Zool. Rep., pl. iv, fig. 3.

Dimensions :—Width of disk to at least 650 millim.

Range :—Bays and estuaries of South Queensland. Nerang Creek, Brisbane River, Moreton Bay, and Great Sandy Strait (*Ogilby*).

Genus 33—**HIMANTURA** Müller & Henle, Arch. f. Nat., 1837, i, p. 400 (*uarnak*).

53. *uarnak* Forskal. "COACHWHIP RAY."

Deser. Anim., 1775, p. 18 (as *Raja uarnak*)—Günther, Catal., viii, p. 473 ; Macleay, Catal., 1117 (as *Trygon uarnak*)—Garman, Plagiost., p. 376 (as *Dasybatus uarnak*).

Figure :—Annandale, Mem. Ind. Mus., ii, pls. 1-3.

Dimensions :—Width of disk to at least 155 cm.

Range :—Coast of Queensland from south to north. Moreton Bay, S.Q. (*Q.M., O.C.*). Platypus Bay, S.Q. and Pine Peak, M.Q. (*Endeavour Coll.*). Burdekin River, N.Q. (*Macleay*). Goode Island, T.S. (*Tosh Coll.*).³⁴

Genus 34—**UROGYMNUS** Müller & Henle, Arch. f. Nat., 1837, i, p. 434

(*asperrimus = africanus*). Syn.—*Rhachinotus* Cantor 1849.

54. *africanus* Schneider. "THORNY RAY."

Bloch. Syst. Ichth., 1801, p. 367 (as *Raja africana*)—Günther, Catal., viii, p. 471 ; Macleay, Catal., 1116 (as *U. asperrimus*)—Garman, Plagiost., p. 374 (as *Rhachinotus africanus*).

Figure :—Day, Fish. India, pl. 195, fig. 1.

Dimensions :—Width of disk to at least 630 millim.

Range :—Coast of North Queensland. Cape York (*Macleay*). Darnley Island (*Tosh Coll.*).

Subfamily *c*—**PTEROPLATEINÆ**. "THE BUTTERFLY RAYS."

Genus 35—**PTEROPLATEA** Müller and Henle, Arch. f. Nat., 1837, i, p. 400 (*altavela*.) Syn.—*Ætopleatea* Müller & Henle 1841.

55. *australis* Ramsay & Ogilby. "BUTTERFLY RAY." RAT-TAILED RAY.

Proc. Linn. Soc. N. S. Wales, x, pt. 4, 3 April 1886, p. 575 : Cape Hawke, N.S.W.

Unfigured.

Dimensions :—Width of disk to 100 cm.

Range :—Coasts of South and Middle Queensland. Moreton Bay, S.Q. (*Ogilby*). Off Port Curtis—Jenny Lind Buoy—S.Q., in 14 fath. ; Cape Gloucester in 25 fath. (*Endeavour Coll.*).³⁵

³⁴ If *H. gerrardi* be really distinct from this species, which I greatly doubt, Tosh's figure (Marine Biologist's Report 1903, p. 4, pl. 5, fig. 2) suggests its occurrence on our south coast (*Nerang Creek*).

³⁵ Garman's assumption of the identity of our species with *P. tentaculata* is distinctly unhappy; the constantly shorter annulated tail and uniformly umber brown coloration distinguish it at a glance from that species.

Family XIII—MYLIOBATIDÆE. "THE EAGLE RAYS" or "BULL RAYS."

Subfamily *a*—MYLIOBATINÆ.Genus 26—**MYLIOBATUS** (Duméril) Cuvier, Règne Anim., ii, 1817, p. 137 (*aquila*).56. **hamlyni** Ogilby. "PURPLE RAY."Ann. Queensl. Mus., No. 10, 1 Nov. 1911, p. 40: Moreton Bay, S.Q.—Macleay, Catal., 1122 (as *M. aquila*, name only).*Unfigured.**Dimensions*:—Width of disk in type 280 millim. Certainly attains a much larger size.*Range*:—Coast of South Queensland. Moreton Bay (*Ogilby*).³⁶Genus 37—**ÆTOBATUS** Blainville, Bull. Soc. Philom., 1816, p. 112 (*narinari*). Syn.—*Stoasodon* Cantor 1849.57. **narinari** Euphrasen. "JUMPING RAY."Vet. Akad. Nya. Handl., xi, 1790, p. 217: Brazil (as *Raia narinari*)—Günther, Catal., viii, p. 492; Macleay, Catal., 1125 (as *Ætobatis narinari*)—Garman, Plagiost., p. 441.*Figures*:—Jordan & Evermann, Fish. N. & M. Amer., pls. 15 & 16; Garman, *ibid.*, pl. 49, figs 1-3 (*dentition*).*Dimensions*:—Width of disk to fully 4.5 mm.*Range*:—Coast of Queensland from south to north. Moreton Bay and Wide Bay, S.Q. (*Ogilby*). Cape York, N.Q. (*Macleay*).Subfamily *b*—RHINOPTERINÆ.Genus 38 — **RHINOPTERA** (Kuhl) Cuvier, Règne Anim., ed. 2, ii., 1829 (*marginata*).58. **neglecta** Ogilby. "COW-NOSE RAY."Mem. Queensl. Mus., i, 27 Nov. 1912, p. 32: Moreton Bay, S.Q.—de Vis, Proc. Roy. Soc. Queensl., ii, p. 12 (as *R. javanica*).*Unfigured.**Dimensions*:—Width of disk in type 860 millim.*Range*:—Coast of South Queensland. Moreton Bay (*de Vis*).³⁷

³⁶ This species is the antipodean representative of the North Atlantic *M. aquila*, from which it differs in dentition as noted by Günther (Catal., viii, p. 489). Otherwise the two forms agree so well that it might possibly be preferable to refer to the southern ray as *Myliobatis aquila hamlyni*. Kent, writing of his visit to Elliot Island, remarks:—"Large blue-spotted Sting Rays, *Myliobatis aquila*, bask lazily in the intervening sandy patches" (Great Barrier Reef, p. 103). This statement is certainly wrong as there is no evidence to show that the Bull Ray (*M. australis*) has ever been found in Queensland waters. Kent has evidently mistaken either *Dasybatus kuhlii*, or young *Ætobatus narinari*, or both for that species.

³⁷ Closely allied to, perhaps identical with, *R. jayakari* Boulenger from the Persian Gulf.

Family XIV—MOBULIDÆ. "THE SEA DEVILS."

Genus 39—**MOBULA** Rafinesque, Ind. Itt. Sicil., 1810, p. 61 (*auriculata*=*mobular*).59. **eregoodoo** Cantor. "HORNED RAY."Journ. Asiat. Soc. Bengal, xviii, 1849, p. 1420 : Sea of Pinang ; Günther, Catal., viii, p. 497 (as *Dicerobatis eregoodoo*)—Garman, Plagiost., p. 451.*Figures* :—Day, Fish. India, pl. 193, fig. 1 ; Kent, Great Barrier Reef, pl. 48, figs. 2 & 3.*Dimensions* :—Width of disk to at least 5.5 mm.*Range* :—Coast of Queensland from south to north. Moreton Bay (*Q.M., O.C.*). Palm Islands (*Kent*).³⁸

APPENDIX A.

Under this heading will be found simple keys to (1) the families of the Queensland sharks and rays ; (2) the genera of such families as are not monotypic ; and (3) the species of the same.³⁹

By this means it is hoped that all those who are interested in nature-study, especially those in our schools and universities, may be enabled to identify such species as come within their purview, and thus little by little enlarge our knowledge. And it is not only by the addition of new or exotic species to the Queensland list that such knowledge may be extended, but it is of even higher importance to gain a closer insight into the habits, the comings and goings, and the limits of distribution of the common species with which we are familiar from day to day, but of whose inner life we are woefully ignorant. Only by the close observation of local workers along our whole coastline can this ignorance be dispelled. In such work the veriest tyro has an equal chance with the expert of making important discoveries.

KEY 1—OUR EUSELACHIAN FAMILIES.

*a*¹. *Pleurotremata* :—Gill-openings lateral.

*b*¹. Two spineless dorsal fins ; anal fin present (*Galcoidei*).

*c*¹. Eye without nictitating membrane.

*d*¹. No oro-nasal grooves.

*e*¹. Last gill-opening in front of base of pectoral.

*f*¹. Dorsal fins subequal in size i. CARCHARIIDÆ.

*f*². Second dorsal fin much smaller than first.

*g*¹. Caudal fin much produced, the peduncle without keel ii. ALIPIIDÆ.

*g*². Caudal fin of moderate length, lunate, the peduncle strongly keeled iii. ISURIDÆ.

*c*². Last one or two gill-openings above base of pectoral v. SCYLIORHINIDÆ.

*d*². Oro-nasal grooves present iv. ORECTOLOBIDÆ.

*c*². Eye with nictitating membrane vi. GALEIDÆ.

*b*². Dorsal fins with or without a spine ; anal fin absent or present (*Squaloidei*).

*h*¹. Each dorsal fin preceded by a spine ; anal fin present vii. HETERODONTIDÆ.

*a*². *Hypotremata* :—Gill-openings ventral ; no anal fin.

*i*¹. Electric organs present, between pectoral fins and head (*Narcacionoidei*) viii. NARCACIONIDÆ

*i*². No electric organs (*Batoidei*).

*j*¹. Tail stout and muscular ; two dorsal fins (*Sarcura*).

³⁸ Most of Kent's remarks on this fish refer more properly to *A. narinari*.

³⁹ The genera and species which belong to monotypic families (so far as this State is concerned) may be easily identified by the family characters given in Key 1.

- l*¹. Trunk passing gradually into tail; ovoviviparous.
*l*¹. Snout much produced and saw-like, without tentacles ix. PRISTEIDÆ.
*l*². Snout not saw-like x. RHINOBATIDÆ.
*k*². Trunk abruptly contracted at base of tail; oviparous xi. RAJIDÆ.
*j*². Tail slender; dorsal fin absent or single and vestigial; ovoviviparous (*Masticura*).
*m*¹. Pectoral fins not produced anteriorly xii. DASYBATIDÆ.
*m*². Pectoral fins produced anteriorly to form cephalic appendages.
*n*¹. Teeth usually few, some or all laterally expanded; nostrils approximate
xiii. MYLIOBATIDÆ.
*n*². Teeth numerous and minute, sometimes absent in one or the other jaw; nostrils
remote xiv. MOBULIDÆ.

KEY 2—OUR EUSELACHIAN SUBFAMILIES AND GENERA.

i. CARCHARIIDÆ :—Monotypic, *v. supra*.ii. ALOPIIDÆ :—Monotypic, *v. supra*.

iii. ISURIDÆ :—

*a*¹. *Isurinae* :—Teeth long, slender, smooth.*b*¹. Teeth without basal cusp 3. ISURUS.*a*². *Carcharodontinae* :—Teeth compressed, triangular, serrated 4. CARCHARODON.

iv. ORECTOLOBIDÆ :—

*a*¹. *Ginglymostominae* :—Spiracles minute.*b*¹. Teeth in three series, multicuspoid; origin of second dorsal in advance of the anal 5. NEBRIUS.*a*². *Orectolobinae* :—Spiracles large.*c*¹. Lower lip with a symphyseal groove; ovoviviparous.*d*¹. Teeth dissimilar; sides of head with a more or less interrupted series of dermal lobes
6. ORECTOLOBUS.*d*². Teeth all similar, small and tricuspoid; sides of head without dermal lobes.*e*¹. Head strongly depressed; anal fin close to caudal 7. BRACHELURUS.*e*². Head not depressed; anal fin remote from caudal 8. HETEROSCYLLIUM.*c*². Lower lip without symphyseal groove; oviparous, the egg-case bag-like.*f*¹. Caudal fin of moderate length 9. CHILOSCYLLIUM.*f*². Caudal fin greatly produced 10. STEGOSTOMA.

v. SCYLIORHINIDÆ :—

*a*¹. Angle of mouth with a distinct labial fold 11. HALÆLURUS.

vi. GALEIDÆ :—

*a*¹. Snout produced longitudinally, in direction of vertebral axis.*b*¹. *Mustelinae* :—Spiracles moderate.*c*¹. Teeth small and pavement-like 12. MUSTELUS.*b*². *Galcinae* :—Spiracles minute; teeth acute, serrated, depressed.*d*¹. No pit at base of caudal 13. GALEUS.*d*². Precaudal pit present 14. GALEOCERDO.*b*³. Spiracles absent; teeth acute.*e*¹. Teeth everywhere smooth, both base and cusp.*f*¹. Teeth strongly depressed.*g*¹. Some of the anterior teeth enlarged, their bases swollen and rounded 15. PHYSODON.*g*². None of the teeth enlarged, their bases narrow 16. SCOLIODON.*f*². Teeth erect or nearly so 17. APRIONODON.*e*². Bases of teeth serrated in one or both jaws, the cusps smooth.*h*¹. Teeth in lower jaw erect, in upper suberect and coarsely serrated on one or both sides of
base HYPOPRION.**h*². Teeth in both jaws depressed, their outer bases serrated 18. RHIZOPRION.*e*³. All or most teeth serrated on both base and cusp, their form variable 19. CARCHARINUS.*a*². *Cestracioninae* :—Snout expanded laterally, at an angle to the vertebral axis 20. CESTRACION.

vii. HETERODONTIDÆ :—

a¹. Ramal symphyses long ; supraorbital ridges gradually decreasing in height posteriorly 21. HETERODONTUS.

a². Ramal symphyses short ; supraorbital ridges terminating abruptly behind 22. GYROPLEURODUS.

viii. NARCACIONIDÆ :—

a¹. Tail very short, with two dorsal fins ; spiracles close behind the eye, fringed 23. HYPNOS.

ix. PRISTEIDÆ :—Monotypic, *v. supra*.

x. RHINOBATIDÆ :—

a¹. *Rhampobatinae* :—First dorsal fin originating above base of ventrals.

b¹. Snout short, broad, obtuse ; dental surface of jaws deeply undulous 25. RHAMPHOBATIS.

b². Snout narrow, produced, acute ; dental surface of jaws feebly undulous 26. RHYNCHOBATUS.

a². *Rhinobatinae* :—First dorsal fin inserted well behind the ventrals.

c¹. Nasal valves not confluent 27. RHINOBATUS.

xi. RAJIDÆ :—

a¹. Ventral fins deeply notched ; dorsal fins far back, near tip of tail 28. RAJA.

xii. DASYBATIDÆ :—

a¹. Disk not or not much wider than long, the outer angles rounded or nearly so.

b¹. *Urolophinae* :—Tail short, stout, muscular, terminating in a well-developed rayed caudal fin. 29. UROLOPHUS.

b². *Dasybatinae* :—Tail moderate or long, without dorsal or caudal fin.

c¹. Caudal spine developed.

d¹. Tail moderate, inferiorly with a deep cutaneous fold which extends to its tip 30. TÆNIURA.

e¹. Dental surface of upper jaw angular ; tail inferiorly with a deep cutaneous fold, which is proximal in position, leaving a long free tip 31. HYPOLOPHUS.

e². Dental surface of jaws straight or undulous.

f¹. Tail moderate, with a low cutaneous fold on the upper or lower border, or on both 32. DASYBATUS.

f². Tail very long and slender, without folds 33. HIMANTURA.

c². Tail long, spineless, foldless ; back covered with osseous tubercles intermixed with spinigerous bucklers 34. UROGYMNUMS.

a². *Pteroplateinae* :—Disk much wider than long, the outer angles pointed ; tail short, slender, rat-like, the dorsal fin and caudal spine, when present, vestigial 35. PTEROPLATEA.

xiii. MYLIOBATIDÆ :—

a¹. *Myliobatinae* :—Rostral lobe simple, median.

b¹. Teeth in several series, middle widest 36. MYLIOBATIS.

b². Teeth in a single series, very wide 37. AETOBATUS.

a². *Rhinopterinae* :—Rostral lobe paired, lateral ; teeth in several series, middle usually widest 38. RHINOPTERA.

xiv. MOBULIDÆ :—

a¹. *Mobulinae* :—Mouth inferior.

b¹. Teeth in the upper jaw only CERATOPTERA.*

b². Teeth in both jaws 39. MOBULA.

a². *Mantinae* :—Mouth anterior.

c¹. Teeth in the lower jaw only. MANTA.*

Note :—None of the three genera to which an asterisk is attached has as yet been recorded from our coast, but *Hypporion* has been included, both because the Indo-Malayan *H. maclohi* has been taken in Port Jackson, but more especially to demonstrate the dental differences which separate it from my genus *Rhinoprion*. *Manta* too has been known for many years from Port Jackson ; therefore in view of the wide tropical distribution of the mobuloid rays, and the difficulty of obtaining specimens owing to their huge bulk, it has been thought advisable to publish the above key to the genera, in order to facilitate the identification of such examples as may from time to time be captured.

KEYS TO THE SPECIES OF QUEENSLAND SELACHIANS.

1. CARCHARIAS :—

- a*¹. Head not depressed ; 4th and 5th teeth on each side of upper jaw much smaller than the adjacent teeth ; eye-diameter one fifth of preoral length 1. *arenarius*.

2. ALOPIAS :—

A single species, inhabiting the warmer parts of the Atlantic and Pacific Oceans ; *v. supra*, p. 74.

3. ISURUS :—

- a*¹. First dorsal originating close behind vertical from hinder angle of pectoral ; second dorsal partly before anal 3. *glaucus*.

4. CARCHARODON :—

Monotypic ; the single species inhabiting all warm seas ; *v. supra*, p. 74.

5. NEBRIUS :—

Monotypic ; an inhabitant of the warmer latitudes of the Indian & Western Pacific Oceans ; *v. supra*, p. 75.

6. ORECTOLOBUS :—

- a*¹. Nasal cirrus lobate.

*b*¹. Sides of head with a nearly continuous series of branched lobes.

- c*¹. Origin of first dorsal well postmedian 6. *ogilbyi*.

*b*². Sides of head with only a few widely spaced lobes.

*d*¹. Lobe of nasal cirrus bifid or trifid, rarely simple.

- e*¹. Body with large light ocelli 7. *maculatus*.

- e*². Body marbled, with distinct cross-bands 8. *ornatus*.

- a*². Nasal cirrus simple ; dermal lobes three on each side, widely separated and entire 9. *teniaculatus*.

7. BRACHÆLURUS :—

One species only, from Eastern Australia ; *v. supra*, p. 76.

8. HETEROSCYLLIUM :—

One species only, from South Queensland ; *v. supra*, p. 76.

9. CHILOSCYLLIUM :—

- a*¹. Fold of lower lip interrupted ; a large ocellus above the pectoral fin.

- b*¹. Body with large scattered dark spots 12. *ocellatum*.

- b*². Body with numerous small close-set dark spots 13. *trispiculare*.

- a*². Fold of lower lip continuous ; no ocellus above the pectoral fin.

- c*¹. Origin of first dorsal above anterior section of ventral-base 14. *punctatum*.

10. STEGOSTOMA :—

Monotypic ; inhabiting the warmer parts of the Indian and Western Pacific Oceans.

11. HALÆLURUS :—

- a*¹. Base of anal less than ano-caudal interspace.

- b*¹. Anterior nasal valve not overlapping mouth ; lower labial fold nearly reaching symphysis 16. *labiosus*.

12. MUSTELUS :—

- a*¹. Dorsal originating above inner angle of pectoral.

- b*¹. Teeth each with an obscure transverse ridge ; upper labial fold the longer 17. *antarcticus*.

13. GALEUS :—

- a*¹. Second dorsal and anal fins subequal ; snout somewhat produced, as long as width of mouth.

- b*¹. First dorsal equidistant from pectoral and ventral ; ventral originating well behind middle of length 18. *australis*.

14. GALEOCERDO :—

*a*¹. Monotypic ; inhabiting all tropical and temperate seas. 19. *arcticus*.

15. PHYSODON :—

*a*¹. Snout long ; labial folds short ; anal more than thrice as long as second dorsal 20. *mülleri*.

*a*². Snout short ; labial folds well developed ; anal less than twice as long as second dorsal 21. *taylori*.

16. SCOLIODON :—

*a*¹. Labial grooves very short.

*b*¹. Snout short, preoral length two fifths of head ; anal wholly in advance of second dorsal 22. *jordani*.

*b*². Snout long, preoral length more than half of head ; anal partly in advance of second dorsal

*c*¹. First dorsal higher than long ; eye midway between tip of snout and fourth gill-opening 23. *affinis*.

*c*². First dorsal longer than high ; eye midway between tip of snout and first gill-opening 24. *acutus*.

*a*². Labial folds well developed, outer about one third ramal length.

*d*¹. Second dorsal five ninths of base of anal 25. *longmani*.

17. APRIONODON :—

*a*¹. Snout short and broad.

*b*¹. Second dorsal rather larger than and originating somewhat in advance of anal 26. *acutidens*.

18. RHIZOPRION :—

A single species from the coasts of South and Middle Queensland ; *v. supra*, p. 80.

19. CARCHARHINUS :—

*a*¹. Tail shorter than head and trunk ; snout broadly rounded 28. *stevensi*.

*a*². Tail as long as head and trunk.

*b*¹. Pectoral extending to below anterior third of first dorsal ; snout three fourths of width of mouth 29. *amblyrhynchus*.

*b*². Pectoral extending to below end of first dorsal.

*c*¹. Snout two thirds of width of mouth 30. *spenceri*.

*c*². Snout as long as width of mouth 31. *melanopterus*.

20. CESTRACION :—

*a*¹. Nostril remote from eye 32. *blochii*.

*a*². Nostril adjacent to eye.

*b*¹. Rostral dilation at nostril longer than wide ; narial groove less than one third width of head 33. *lewini*.

*b*². Rostral dilation at nostril wider than long ; narial groove more than one third width of head 34. *tudes*.

21. HETERODONTUS :—

*a*¹. Base of anal rather less than half of ano-caudal interspace 35. *phillipi*.

22. GYROPLEURODUS :—

*a*¹. Base of anal longer than ano-caudal interspace ; first dorsal originating above end of pectoral base 36. *galatus*.

23. HYPNOS :—

Monotypic ; the single species inhabiting temperate Australia.

24. PRISTIS :—

*a*¹. Posterior border of teeth grooved.

*b*¹. Rostrum long and slender, its width behind the proximal pair about one ninth of its length ; lateral teeth 25 or more, the width of the 1st about one sixth of its distance from the 2nd ; no lower caudal lobe 38. *zysron*.

*b*². Rostrum short and broad, its width behind the proximal pair about two ninths of its length ; lateral teeth 22 or less, the width of the 1st about two fifths of its distance from the 2nd ; lower caudal lobe present but inconspicuous 39. *microdon*.

*a*². Lateral teeth 21, the posterior border rounded ; no lower caudal lobe 40. *clavata*.

25. RHAMPHOBATIS :—

A single species frequenting the shores of the warmer parts of the Indian and Western Pacific Oceans ; *v. supra*.

26. RHYNCHOBATUS :—

*a*¹. Dorsal originating above base of ventrals 42. *djiddensis*.

27. RHINOBATUS :—

*a*¹. Internarial width less than half the narial diameter ; spiracle with two conspicuous folds 43. *armatus*.

*a*². Internarial width three tenths more than narial diameter ; spiracle without folds 44. *banksii*.

28. RAJA :—

*a*¹. Lavender-gray or pale brown with groups of small black spots, which are white-edged in the young ; size small 45. *polyommata*.

*a*². Fulvous brown, uniform or with obscure lighter spots ; size moderate 46. *australis*.

29. UROLOPHUS :—

*a*¹. Width of mouth less than two fifths of preoral length 47. *testaceus*.

30. TÆNIURA :—

*a*¹. Skin of back smooth ; fuscous, with sky-blue spots and bands 48. *lymma*.

*a*². Skin of back spinigerous ; brown, without spots or bands 49. *mortoni*.

31. HYPOLOPHUS :—

A single species inhabiting the warmer parts of the Indian and Western Pacific Oceans ; *v. supra*, p. 87.

32. DASYBATIS :—

*a*¹. Disk two thirds of tail ; buccal papillæ two ; pale brown or yellow, blue-spotted .. 51. *kuhlii*.

*a*². Disk four ninths of tail ; buccal papillæ seven ; uniform olive-brown 52. *fluviorum*.

33. HIMANTURA :—

*a*¹. Tail at least thrice the length of the body ; buccal papillæ four or more ; uniform sandy brown 53. *uarnak*.

34. UROGYMNUM :—

A single species, inhabiting the warmer parts of the Indian and Western Pacific Oceans ; *v. supra*, p. 88.

35. PTEROPLATEA :—

*a*¹. Tail three eighths of the length of the disk, annulated brown and yellow, or white blotched with black 55. *australis*.

36. MYLIOBATIS :—

*a*¹. Lower jaw with nine series of ventral plates, the width of the first three sevenths of that of last ; base of dorsal more than half its distance from ventral base 56. *hamlyni*.

37. ÆTOBATIS :—

*a*¹. Snout broadly rounded ; back white-spotted 57. *narinari*.

38. RHINOPTERA :—

*a*¹. Disk more than twice as wide as long ; upper median tooth two thirds wider than adjacent tooth 58. *neglecta*.

39. MOBULA :—

*a*¹. No caudal spine ; disk two thirds of length of tail *eregoodoo*.

Note :—In the British Museum Catalogue of Fishes (viii, p. 486) Dr. Günther records a specimen of *Callorhynchus antarcticus* from Cape Upstart. The only cape of that name is on the coast of Queensland near Bowen, and as it is very certain that no callorhynchid was ever caught within hundreds of miles of that place, the species must be expunged from our list.

Class IV—PISCES.

Subclass TELEOSTEI.

Order I—ISOSPONDYLI.

Suborder *a*—CLUPEOIDEI. "The Herrings, etc."

Family I—ELOPIDÆ. "THE TARPONS."

Genus 1—**MEGALOPS** (Commerçon) Lacépède, Hist. Nat. Poiss., v, 1803, p. 289 (*filamentosus* = *cyprinoides*). Syn.—*Brisbania* Castelnau 1878.

1. *cyprinoides* Broussonet. "OX-EYE HERRING."

Ichthyologia, 1782, pl. 9 (as *Clupea cyprinoides*)—Günther, Catal., vii, p. 471; Macleay, Proc. Linn. Soc. N. S. Wales, iv, p. 383—Castelnau, Proc. Linn. Soc. N. S. Wales, ii, p. 242 (as *Brisbania stageri*).

Figure:—Castelnau, *ibid.*, pl. 3.

Dimensions:—To about 600 millim.⁴⁰

Uses:—An excellent table fish.

Range:—Coasts of Queensland from south to north, ascending rivers.

Genus 2—**ELOPS** Linnæus, Syst. Nat., ed. 12, 1766, p. 518 (*saurus*).

2. *hawaiiensis* Regan. "BANANA FISH."

Ann. & Mag. Nat. Hist. (8) iii, 1909, p. 39: Hawaii; Ogilby, Mem. Queensl. Mus., iii, p. 133—Regan, *ibid.* (as *E. australis*).

Figure:—Jordan & Richardson, Mem. Carnegie Mus., iv, pl. 66, fig. 1.

Dimensions:—To at least 600 millim.

Uses:—Of good flavour, but not equal to the preceding.

Range:—Coasts of Queensland from south to north.

Family II—ALBULIDÆ. "THE LADY-FISHES."

Genus 3—**ALBULA** Gronow, Zoophyll., 1763, p. 102.

3. *glossodonta* Forskal. "LADY-FISH."

Descr. Anim., 1775, p. 68: Jeddah (as *Argentina glossodonta*)—Jordan & Evermann, Bull. U.S. Bur. Fisher., xxiii, p. Ogilby, Proc. Roy. Soc. Queensl., xxi, p. 87 (as *A. vulpes*).

Figure:—Bleeker, Atlas Ichth., vi, pl. 12, fig. 1 (as *Conorhynchus glossodon*).

Dimensions:—To about 900 millim.

Uses:—Held in little estimation for the table.

Range:—Coasts of Queensland from south to north.

Family III—CHIROCENTRIDÆ. "THE WOLF HERRINGS."

Genus 4—**CHINOCENTRUS** Cuvier, Règne Anim., ed. 1, ii, 1817, p. 178(*dorab*).

4. *dorab* Forskal. "WOLF HERRING."

Descr. Anim., 1775, p. 72; Red Sea (as *Clupea dorab*)—Günther, Catal., vii, p. 475; Macleay, Catal., 905.

⁴⁰ Neither I nor any of our local fishermen have ever seen or heard of a specimen exceeding the above measurement, and we look with grave suspicion on the statement published by Kent, and copied by Stead, that it attains a length of five feet on our coast.

Figure :—Bleeker, Atlas Ichth., vi, pl. 271, fig. 3.

Dimensions :—To a length of 1800 millim. "It grows to six feet in India, but specimens from New Guinea up to twelve feet are recorded" (*Day*).

Uses :—"While of good flavor, it is unfortunately so full of small bones as to be almost useless . . . could probably be turned to good account if cut into suitable lengths and preserved in tins, after the manner of sardines, under such conditions that the bones would be dissolved . . . highly prized as a bait for the capture of the giant perch, *Lates calcarifer*" (*Kent*).

Range :—Coasts of Queensland from south to north.

Family IV—CHANEIDÆ. "THE MILK-FISHES."

Genus 5—**CHANOS** Lacépède, Hist. Nat. Poiss., v, 1803, p. 295 (*arabicus* = *chanos*). Syn.—*Lutodeira* Rüppell 1905.

5. **chanos** Forskal. "MORETON BAY SALMON."

Deser. Anim. 1775, p. 74 : Jeddah (as *Mugil chanos*)—Günther, Catal., vii, p. 473 ; Macleay, Catal., 904 (as *Chanos salmoneus*).

Figure :—Bleeker, Atlas Ichth., vi, pl. 272, fig. 4 (as *C. salmoneus*).

Dimensions :—Attains a length of at least 1200 millim.

Uses :—One of our most delicious food fishes.

Range :—Coasts of Queensland from south to north, entering fresh water.

Family V—CLUPEIDÆ.

Subfamily *a*—DUSSUMIERIINÆ. "THE ROUND HERRINGS."

Genus 6—**STOLEPHORUS** Lacépède, Hist. Nat. Poiss., v, 1803, p. 381 (*japonicus*). Syn.—*Spratelloides* Bleeker 1852.⁴¹

6. **delicatulus** Bennett.

Proc. Zool. Soc. London, i, 1830, p. 168 : Mauritius (as *Clupea delicatula*)—Günther, Catal., vii, p. 464 ; Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, p. 350 (as *Spratelloides delicatulus*).

Figure :—Bleeker, Atlas Ichth., vi, pl. 264, fig. 3.

Dimensions :—To 80 millim.

Uses :—"A very delicate and delicious fish" (*Macleay*). "Might doubtless be turned to commercial account" (*Kent*).

Range :—Coast of North Queensland. Darnley Island (*Alleyne & Macleay*). Many of the inter-tropical districts of the Queensland Coast (*Kent*). Murray Island (*McCulloch*).

⁴¹ Weber and Beaufort (Verh. Kon. Akad. Amsterdam (2) xvii, 1912, No. 3, p. 20) base their objection to the use of Lacépède's name for these fishes on the fact that his second species is undeniably an anchovy ; but since the first species mentioned by him, the *Atherina japonica* of Houttuyn, is not congeneric with his second species, *S. commersonianus*, it follows that, so far as the genus *Stolephorus* is concerned, the latter has no standing whatever.

7. **robustus** Ogilby. "BLUE SPRAT."

Proc. Linn. Soc. N. S. Wales, xxii, pt. 1, 17 Sept. 1897, p. 64 (as *Spratelloides robustus*)—id., Ann. Queensl. Mus., No. 9, p. 5.

Unfigured.

Dimensions :—To about 100 millim.

Uses :—A delicious little fish, which would make an excellent sardine.

Range :—Coast of South Queensland, visiting our shores in enormous shoals during the winter months.

Genus 7—**DUSSUMIERIA** Cuvier & Valenciennes, Hist. Nat. Poiss., xx, 1847, p. 467 (*acuta*).

8. **hasseltii** Bleeker.

Nat. Tijds. Nederl. Ind., i, 1851, p. 422 : Java ; Ogilby, Mem. Queensl. Mus., iii, p. 134.

Figure :—Bleeker, Atlas Ichth., vi, pl. 271, fig. 2.

Dimensions :—To at least 170 millim.

Range :—Coast of North Queensland. Cape York (*Ogilby*).

Subfamily β —HYPERLOPHINÆ. "THE ROUGH-BACKED SPRATS."

Genus 8—**HYPERLOPHUS** Ogilby, Rec. Austr. Mus., ii, pt. 2, Aug. 1892, p. 26 (*sprattellides*). Syn.—*Omochetus* (subgenus) Ogilby 1897.

9. **sprattellides** Ogilby. "SILVER SPRAT."

Ibid., p. 24 (as *Clupea sprattellides*)—id., Proc. Linn. Soc. N. S. Wales, xx, 1897, p. 72 (as *H. copii*).

Unfigured.

Dimensions :—To about 100 millim.

Uses :—A delicate and delicious little fish ; "destined to become the very finest sardine of commerce" (*Ogilby*).⁴²

Range :—Coasts of South Queensland, visiting our bays and sandy beaches in immense shoals during the winter months.

Subfamily γ —CLUPEINÆ. "THE TRUE HERRINGS."

Genus 9—**AMBLYGASTER** Bleeker, Journ. Ind. Arch., iii, 1849, p. 70 (*clupeoides*). Syn.—*Clupanodon* Jordan & Evermann 1896 ; not of Lacépède 1803.

10. **neopilchardus** Steindachner. "PILCHARD."

Denk. Akad. Wien., xli, 1879, p. 12 (as *Clupea neopilchardus*)—Castelnau, Proc. Zool. Soc. Vic., i, p. 187 ; Macleay, Proc. Linn. Soc. N. S. Wales, iv, p. 371 (as *C. sagax*)—Ogilby, Rep. Mar. Dept. Queensl., 1911, p. 15.

Figure :—Ogilby, Edib. Fish. N. S. Wales, pl. 45 (as *C. sagax*).

Dimensions :—To at least 280 millim.

Uses :—An excellent food-fish, which will some day be recognized as a valuable national asset.

Range :—Coast of South Queensland to as far north as Hervey Bay. Moreton Bay (*Ogilby*). Off Cape Moreton (*Endeavour Coll.*).

⁴² Queensland Naturalist, ii, p. 30.